Environmental Impact Assessment Skills:

Environmental Monitoring & Environmental Mitigation and Monitoring Plans

Afternoon Session

AOR/COR Field-based Training - Juba, South Sudan – 24 June 2013

GEMS Environmental Compliance-ESDM Training Series
Africa-Asia-Latin America-Middle East 2012-2013

Definition of environmental monitoring

Environmental monitoring is always BOTH…

1. **Determining whether mitigation is being implemented as required**
2. **Determining whether mitigation is working**

! Environmental monitoring should be a normal part of project monitoring and evaluation

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Monitoring: Part 1

1. Determining whether mitigation is being implemented as required

This includes quantifying mitigation:

- How many staff trained?
- How many trees planted?

There are two basic ways to get the information required: **paper reports** & **field inspection**

For example…

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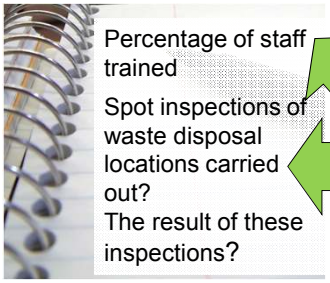
Verify that mitigation is implemented

Mitigation measure is:
"Clinic staff shall be trained to and shall at all times segregate and properly incinerate infectious waste."

Desk assessment:
Clinics are asked to report:



Percentage of staff trained

Spot inspections of waste disposal locations carried out?
The result of these inspections?

Field inspection

shows waste is segregated at point A, but not incinerated at point B.

Mitigation implementation indicators

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Monitoring: Part 2

2. Determining whether mitigation is <u>working</u>

= Systematic observation of key environmental conditions. . .

(1) that correspond to impacts & mitigation measures and/or

(2) upon which the project depends for its success

Example: a road project may lead to stream sedimentation. **Stream turbidity** is monitored.

Example: A water supply project depends on clean source water. **Source water quality** is monitored.

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Monitoring environmental conditions

<u>Systematic observation</u> of key environmental conditions

= systematically choosing and assessing <u>environmental indicators</u>

environmental indicators are

Signals of/proxies for

- **Environmental health**
- **Ecosystem function**
- **Community well-being**

They are NOT "F" indicators or core program performance indicators

For example…

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Environmental indicators: sometimes complicated, often simple

- **Environmental Indicators <u>may</u> require laboratory analysis or specialized equipment & techniques**
  - Testing water for pesticide residues
  - Automatic cameras on game paths for wildlife census
  - Etc.
- **But <u>indicators are often VERY SIMPLE</u>, especially for small-scale activities**

! Simple indicators can be more useful and appropriate than more complicated ones!

For example. . .

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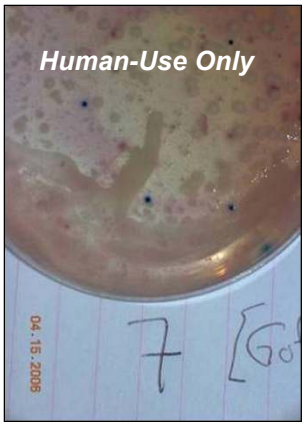
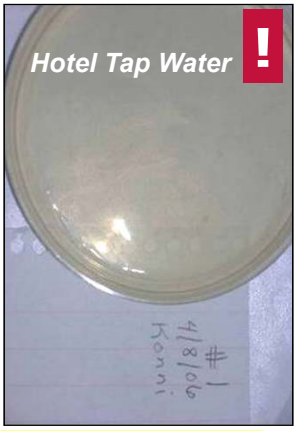
Example Indicator: coliform contamination

Water quality tests with simple, inexpensive test kit . . .





Purple Color = Fecal Coliforms | Pink Color = Other Coliforms

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Examples of simple environmental indicators

Measuring erosion

Topsoil loss from slopes upstream in the watershed **(top)** is assessed with a visual turbidity monitor **(bottom).**

Surface contamination by sewage

Visual inspection behind the latrine **(top)** reveals a leaking septic tank **(bottom).**

What are the limitations of this indicator?

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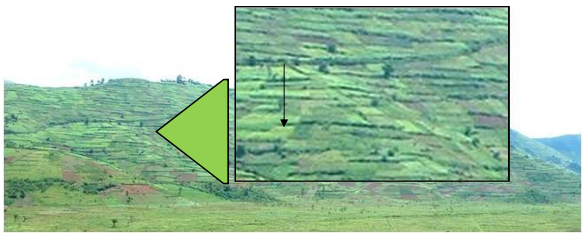
Examples of simple environmental indicators



Soil depletion. Visual inspections show fertility gradients within terraces.

(Dark green cover indicates healthy soil; yellow cover indicates depletion)

Groundwater levels Are measured at shallow wells with a rope and bucket.

! Choose the simplest indicator that meets your needs!

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Systematically assessing environmental indicators

Monitoring often requires SYSTEMATIC measurement of indicators to <u>distinguish the impacts of the activity from other factors</u>

This requires decisions about:

1. **Location of measurement**
2. **Timing & frequency of measurement**

and often. . .

3. **Other factors**

For example…

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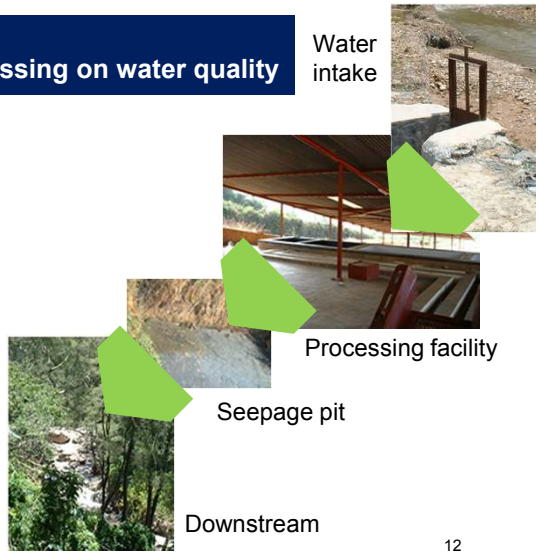
Systematically assessing environmental indicators

Example:
Impact of agricultural processing on water quality

1. **Location**
   Water samples should be taken at the intake, and downstream of seepage pits.

2. **Timing & frequency**
   Samples at different locations should be taken at the same time. Samples should be taken at **high & low flow** during the processing season

3. **What else?**



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Being systematic

Sometimes monitoring can be more complicated.

Some common monitoring strategies:

Monitor the actual project, plus a similar non-project area (a "control")

Monitor at multiple stations/ sampling locations

Do research to obtain good baseline data

All are intended to help distinguish impacts from NORMAL VARIABILITY and other factors

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Good environmental monitoring. . .

- Tells you clearly and cost-effectively if **mitigation is sufficient and effective.**
- Usually requires a **combination** of:
  - Environmental indicators
  - Mitigation implementation indicators
- Do no more than needed: Prioritize the most serious impacts & issues.

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Version: September 2012
download at www.usaidgems.org
comments and corrections to XXXX

GEMS Visual Field Guide: CONSTRUCTION#

for quick identification of serious environmental & occupational health and safety concerns in small-scale construction

About the GEMS Visual Field Guide Series

GEMS Visual Field Guides are intended for use during field visits by USAID and Implementing Partner staff who are not environmental specialists.

They are intended to ensure that the most common serious environmental deficits in activity design and management are quickly and easily identified for corrective action.

Note that an activity may be subject to environmental design and management conditions specified in its Environmental Assessment or Initial Environmental Examination, or by host country regulation which are not captured in this document.

The field guides complement the more detailed guidance found in USAID's Sectoral Environmental Guide-lines.

Consult the Guidelines for guidance regarding remedies, mitigation and corrective actions.

The Guidelines are available at www.usaidgems.org.

Disclaimer: This field guide was initially developed by The Cadmus Group, Inc. for International Resources Group (IRG) under USAID/Africa Bureau's Environmental Compliance and Management Support (ENCAP) Program, Contract Number EPP-I-00-03-00013-00, Task Order 10. 12. Its contents are the sole responsibility of the authors and do not necessarily reflect the views of USAID or the United States.

A. Pre-construction Site Survey. *A "YES" answer to any of the following indicates that construction on the site will pose higher-than-normal environmental risks. A site-specific environmental review setting out mitigation measures sufficient to address these risks will usually be required. Notify the Chief of Party and A/COTR.*

A.1. Is the site within 30m of a permanent or seasonal stream or water body?

YES / NO

Issue 1: Construction or operation may result in sedimentation or other contamination of the water.

Issue 2: Construction may interfere with drainage of upstream lands.

Image: a new hotel approaches completion on the shore of a fragile freshwater lake.

A.2. Is the site heavily forested? In a permanent or seasonal wetland? In a relatively undisturbed ecosystem? In a protected area?

YES / NO

Issue: These sites are high value due to their biodiversity and/or other "ecosystem services" (e.g. flood control, breeding habitat) they provide. Thus, any adverse impacts of facility construction or operation are far more likely to be significant.

Image: a new school site is carved out of a forested hilltop.

A.3. Does the site show evidence of having been used as a waste dump?

YES / NO

Issue: Hazardous materials such as pesticides may be present that pose a health danger to construction workers and users, particularly if disturbed. There is a higher chance that groundwater is contaminated and unusable. Dump sites attract and breed disease vectors.

A.4. Is the site sloped at greater than 15 degrees?

Issue: Strongly sloped sites present high risks for erosion that can permanently degrade the site and runoff that can add sediment load to nearby surface waters and result in gulying on adjoining lands & roads.

Image: The view downslope from a hilltop construction site shows erosion and runoff channels.

A.5. Is the site occupied or cultivated? YES / NO

→ Issue: Displacing inhabitants or depriving owners or users of agricultural and other uses of land, can be a significant social impact if not addressed via compensation, resettlement, or negotiation.

(Over)

GEMS visual field guides (www.usaidgems.org)

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Applying monitoring & mitigation to environmental compliance

- Initial Environmental Examination and Environmental Assessment conditions are mitigation requirements
- IEEs (and EAs) are useless unless the conditions they establish are implemented!
- **USAID's environmental procedures require implementation of IEE/EA conditions (mitigation) and monitoring this implementation**

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Practically, implementation of IEE/EA conditions requires that. . .

1. USAID communicates applicable IEE/EA conditions to the Implementing Partner
2. A complete **Environmental Mitigation and Monitoring Plan** (**EMMP**) exists
3. Workplans and budgets integrate the **EMMP**
4. Reporting on **EMMP** implementation is part of project performance reporting

40+ yrs of EIA experience worldwide tells us: NO EMMP = No implementation

EMMPs are critical. What are they?

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Environmental Monitoring & Mitigation Plans: simple in concept

An EMMP:

- **(If needed) TRANSLATES IEE conditions into specific mitigation measures to implement IEE/EA conditions**
- **SETS OUT indicators/criteria for monitoring implementation & effectiveness of mitigation**
- **ESTABLISHES Timing & responsible parties**
- **Usually in table form. Formats are usually flexible.**

See a basic EMMP template in your manual.

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Effective mitigation and monitoring must be…

Realistic Achievable within time, resources and capabilities
Well-targeted Mitigation measures and indicators must respond to IEE conditions (and thus correspond to impacts.)
Considered early **Preventive mitigation** is usually cheapest and most effective. Prevention must be built in at the design stage. If mitigation and monitoring budgets are not programmed at the design stage, they are almost always inadequate.
Funded Funding must be adequate over the life of the activity

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